Name: Key TP:________

CW#87H: Quiz Review
Honors Geometry

CRS	Geometry Content
Objective	14.5-14.8 – Volume and Surface of Sphere, Cones, Pyramids, and Polygons

Pyramid Vocab and Practice:

Vocabulary:

The **lateral area** of a pyramid is: the surface area of the Δ's or faces $= \frac{1}{2}(\text{Perim.})(\text{slant})$

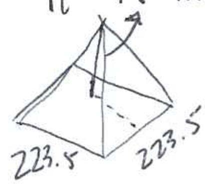
To find the **total surface area** of a regular pyramid you: $(\text{Area of base}) + \frac{1}{2}(\text{Perim})(l)$

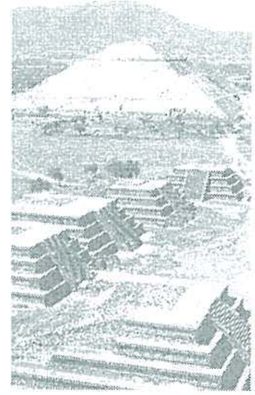
Volume of a regular pyramid is: $\frac{1}{3}(\text{Area of Base}) * \text{height}$

PQQ 1: The **Pyramid of the Sun** in Teotihuacán, Mexico, was built in the second century, A.D. It is about 71 meters tall, and its square base has side lengths of 223.5 meters. Find the lateral surface area of the Pyramid of the sun if it has a slant height of 132.5 meters.

$h = 71$ meters

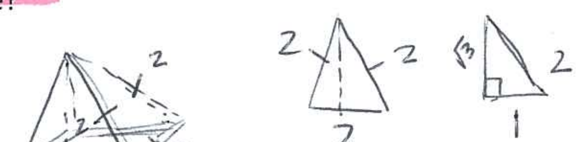
$l = 132.5$



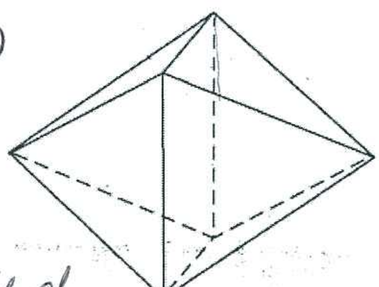


$\boxed{\text{lateral SA} = 59227.5}$

PQQ 2: A game needs random numbers between 1 and 8, inclusive. For that reason, the game uses a die in the shape of a regular octahedron. (A regular octahedron can be made by attaching two square pyramids together along their bases.) The lateral faces are congruent equilateral triangles with side length 2 centimeters. What is the surface area of the die?



$A_{\Delta} = \frac{1}{2}(2)(\sqrt{3})$
$= (\sqrt{3}) * 8$
$= 13.856 \text{ cm}^2$

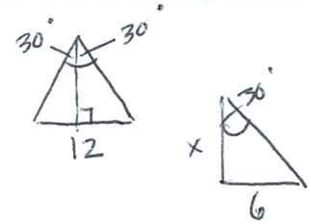


the bases are not included b/c they're not showing.

Round to the nearest hundredth.

PPQ 3: Find the volume of the regular hexagonal pyramid with height equal to the apothem of the base.

Area of the base: (leave in simplified radical form)



$\frac{360}{6} = 60$

$a = 6\sqrt{3}$

$A = \frac{SAN}{2} = \frac{12(6\sqrt{3})(6)}{2}$

$A = 216\sqrt{3} \text{ ft}^2$

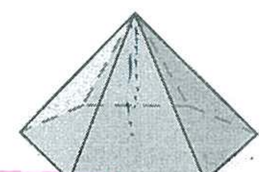
Volume: (Exact answer.)

$(216\sqrt{3}) * h$

$h = a;\ a = 6\sqrt{3}$

$(216\sqrt{3})(6\sqrt{3})(\frac{1}{3})$

~~3888 ft³~~ $\boxed{1296 \text{ ft}^3}$



12 ft

PUSH IT TO THE LIMIT.

Naaaa can't hold us

Cone Vocab. and Practice:

Vocabulary:

The **lateral area** of a cone is: the area of it's top; triangle.

$\pi r l$

To find the **total surface area** of a cone you need to:

$SA = \pi r l + \pi r^2$

To find the **Volume** of a cone you:

$V = 1/3(\pi)r^2h$

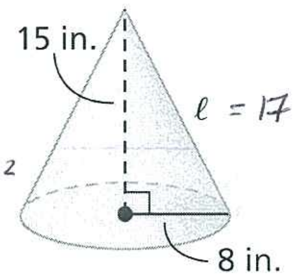
PQQ 4: Given the cone below, find the lateral surface area. Then find the total surface area of the cone.

15, l, 8

$LA = \pi r l$

$15^2 + 8^2 = l^2$

$l = 17$



Exact Lateral SA: 136π

base $= \pi r^2$ $\quad 64\pi + 136\pi$

Total SA Exact: $200\pi \text{ in}^2$

Total SA Approximate: 628.32 in^2

PQQ 5: A sculptor wants to remove stone from a cylindrical block 3 feet high and turn it into a cone. The diameter of the base of the cone and cylinder is 2 feet. What is the volume of the stone that the sculptor must remove? Find your answer using two different methods.

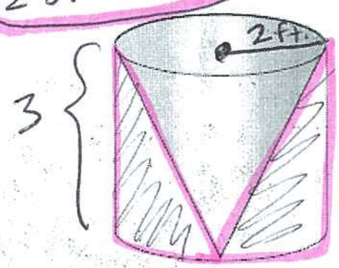
$V_{\text{cylinder}} - V_{\text{cone}}$ $\quad r=2$, $h=3$

$\pi r^2 h \qquad \frac{\pi r^2 h}{3}$

$(4)(3)\pi \qquad 4\pi$

$12\pi - 4\pi$

$8\pi \approx 25.13 \text{ ft}^3$



Round to the nearest hundredth.

PPQ 6: Tony made a teepee for a class project. His teepee had a diameter of 6 feet. The angle the side of the teepee made with the ground was 65°. What was the volume of the teepee? **Round to the nearest hundredth.**

$V = \frac{\pi r^2 h}{3}$

Make sure your calc is in degrees

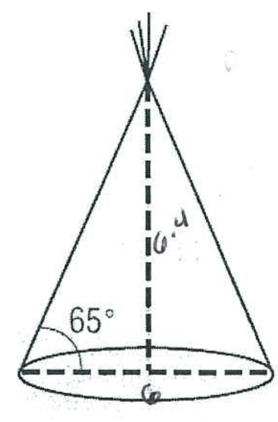
65°, 3

$x = 6.4$ $\quad \tan 65 = \frac{x}{3}$

$3(\tan 65) = x$

$\frac{(3)^2(6.4)\pi}{3}$

$V = 60.63 \text{ ft}^2$



PUSH IT TO THE LIMIT.

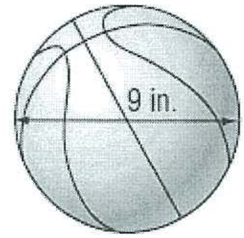
Sphere Vocab. and Practice:

Vocabulary:

The **surface area** of a sphere is: $4\pi r^2$

The **volume** of a sphere is: $\frac{4\pi r^3}{3}$

PQQ 7: Regulation basketballs have a diameter of 9 inches. Find the surface area of the basketball.



$r = 4.5$ $\quad r = \frac{9}{2}$

$SA = 4\pi r^2$

$4(20.25)\pi = 81\pi$

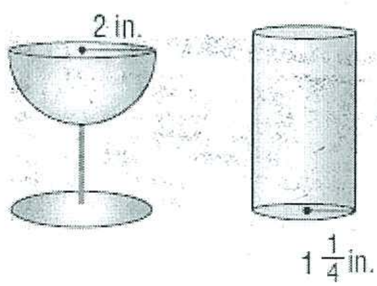
Exact: 81π in^2

Approximate: 254.46 in^2

PQQ 8: Jordan has two glasses. One is a hemisphere of radius 2 inches. The other is a cylinder with base radius 1¼ inches. What is the volume of the hemispherical glass?

$V = \frac{4\pi r^3}{3}\left(\frac{1}{2}\right) = \left(\frac{32\pi}{3}\right)\frac{1}{2}$

$\frac{16}{3}\pi \approx 16.755$ in^2



Round to the nearest thousandth of a square inch.

PPQ 9: Using the information from the previous question, if the cylindrical glass can hold twice as much water as the hemispherical glass, what is the height of the cylinder? Round your answer to the nearest hundredth of an inch.

$2(16.755) = V$

$V = \pi r^2 h$

$2(16.755) = \pi(1.25)^2 h$

$\frac{33.510}{1.5625\pi} = \frac{1.5625\pi h}{1.5625\pi}$

$\boxed{h = 6.89 \text{ in}}$

PUSH IT TO THE LIMIT.

Regular Polygon Vocab and Practice:

Vocabulary:

The **area** of a regular polygon is: $A = \frac{PA}{2}$ ← apothem

$A = \frac{SAN}{2}$

The **surface area** of a regular ↙3D polygon is:

$PA + n(lw)$ ← (area of rect)

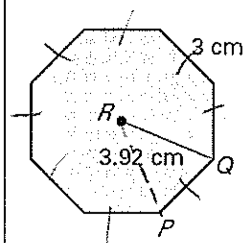
$SAN + n(lw)$

↑ # of sides ↖(area of rect.)

The **volume** of a regular polygon is:

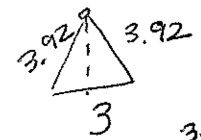
(Area of base) * height

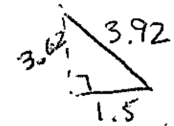
PQQ 10: Find the area of the regular polygon two different ways.



$x^2 + (1.5)^2 = (3.92)^2$

$x = 3.62$

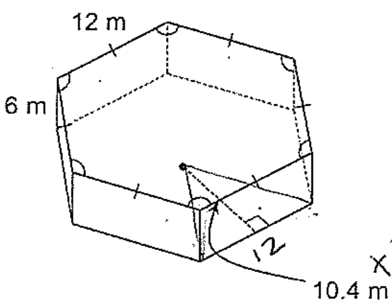


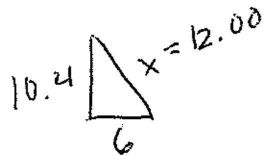


Formula 1: $PA/2 = 24(3.62)/2$

Formula 2: $\frac{SAN}{2} = \frac{(3)(3.62)(8)}{2}$ 43.44 $= 43.44$

PQQ 11: Find the surface area of the regular polygon.





$x^2 = \sqrt{108.16 + 36}$

$x = 12.00$

SA =

$12(10.4)(6) + 12\underbrace{(6)(6)}_{\text{area of } \square \text{ + 6 of them}}$

$748.8 + 432.24$

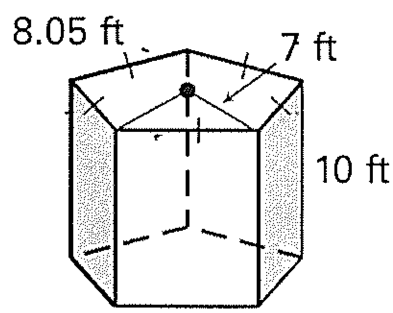
$= 1181.04\ m^2$

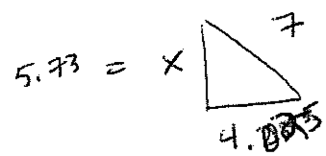
$V = \left(\frac{SAN}{2}\right)h = \left(\frac{(6)(10.4)(12)}{2}\right)$

2246.4 m3 $= (6)\,374.4$

Round to the nearest thousandth of a square inch.

PPQ 12: Find the volume of the regular polygon.





$x^2 + 16.200 = 49$

$49 - 16.02$

$x = \sqrt{32.8}$

$x = 5.73$

$\frac{(8.05)(5.73)(5)}{2} * 10$

$= 1152.57\ ft^3$

PUSH IT TO THE LIMIT.